

### **AMENDMENTS TO THE CLAIMS**

Please add new claims 25-26. No new matter is believed to be introduced by the aforementioned new claims. The following listing of claims will replace all prior versions and listings of claims in the application.

1.     **(Original)**     An opto-electronic device having a first cladding layer separated from a second cladding layer by an active layer, said device comprising:

        a ridge waveguide formed from at least a portion of the first cladding layer, said ridge waveguide having a ridge top surface disposed from the active layer by a first distance; and

        at least one semiconductor mesa fashioned from a protective layer separate from the first cladding layer, said at least one semiconductor mesa having a mesa top surface disposed from the active layer by a second distance greater than said first distance so that said at least one semiconductor mesa shields said ridge waveguide from mechanical damage.

2.     **(Original)**     The device as recited in claim 1, wherein said ridge waveguide is disposed between a first channel and a second channel.

3.     **(Original)**     The device as recited in claim 1, further comprising a metal contact deposited over at least a portion of said ridge waveguide.

4.     **(Original)**     The device as recited in claim 3, wherein said ridge waveguide in combination with said metal contact has a distance from the active layer less than said second distance.

5.     **(Original)**     The device as recited in claim 1, wherein said semiconductor mesa comprises InP.

6.     **(Original)**     The device as recited in claim 1, wherein said protective layer is disposed from the first cladding layer by an etch stop layer.

7.     **(Original)**     The device as recited in claim 1, wherein the opto-electronic device is a device selected from the group consisting of a Fabry-Perot laser, a DFB laser, an optical modulator, and a semiconductor optical amplifier.

8.       **(Original)**     A semiconductor laser grown on a substrate, the laser comprising:  
          a semiconductor laser wafer having an active layer, at least two optical cladding layers,  
          and a ridge waveguide, said ridge waveguide having a ridge top surface disposed from a first  
          surface of said semiconductor laser wafer by a first distance;  
          a plurality of semiconductor mesas formed on said semiconductor laser wafer, said  
          plurality of semiconductor mesas being separate from said at least two optical cladding layers and  
          having a mesa top surface disposed from said first surface by a second distance greater than said  
          first distance so that said plurality of semiconductor mesas shield said ridge waveguide from  
          mechanical damage.
9.       **(Original)**     The laser as recited in claim 8, wherein at least a portion of said ridge  
waveguide is coated with a metal contact.
10.      **(Original)**     The laser as recited in claim 9, wherein said ridge waveguide in  
combination with said metal contact has a third distance from said first surface less than said second  
distance.
11.      **(Original)**     The laser as recited in claim 9, wherein said metal contact has a thickness  
of less than about one micron.
12.      **(Original)**     The laser as recited in claim 8, wherein said second distance is at least  
one micron greater than said first distance.
13.      **(Original)**     The laser as recited in claim 8, wherein at least one of said plurality of  
semiconductor mesas has a thickness of between about 1.5 microns and 3.0 microns.

14. **(Original)** A laser die having an active layer disposed between a first cladding layer and a second cladding layer, the laser die comprising:

a highly doped semiconductor contact layer disposed on the first cladding layer;

a ridge waveguide contacting said contact layer and a metal contact layer formed on said contact layer, said ridge waveguide having a ridge top surface disposed from a first surface of the laser die by a first height; and

at least one semiconductor mesa formed on said contact layer, said at least one semiconductor mesa extending a distance above a top surface of said metal contact to form an elevated surface shielding said ridge from mechanical damage.

15. **(Original)** A laser die as recited in claim 14, wherein said at least one semiconductor mesa is InP.

16. **(Original)** A laser die as recited in claim 14, wherein the first cladding layer and the second cladding layer comprises a materials selected from the group consisting of III semiconductor material, IV semiconductor material, or V semiconductor material.

17. **(Original)** A laser die as recited in claim 14, wherein said elevated surface is elevated from said metal contact layer disposed on said ridge waveguide by at least about 1 micron.

18. **(Original)** A laser die as recited in claim 14, wherein an upper surface of said ridge waveguide contacts said contact layer.

19. **(Original)** A laser die as recited in claim 14, wherein the die has a peripheral edge and said contact layer terminates proximal to said peripheral edge of the laser die.

20. **(Original)** A method of protecting a ridge waveguide of an opto-electronic device, the method comprising:

a step for forming a wafer having a semiconductor layer sequence that includes an active layer, a top clad layer, a doped layer, and a semiconductor protection layer grown on said doped layer;

a step for forming a first semiconductor mesa and a second semiconductor mesa in said wafer; and

a step for forming a ridge waveguide between said first semiconductor mesa and said second semiconductor mesa, wherein said first semiconductor mesa and said second semiconductor mesa are positioned and have a surface height sufficiently greater than a surface height of said ridge waveguide to form an elevated surface shielding said ridge waveguide from mechanical damage

21. **(Original)** The method as recited in claim 20, wherein said step for forming said first semiconductor mesa and said second semiconductor mesa further comprises:

a step for masking said wafer to expose regions in which ridge lasers are to be formed; and

a step for etching said protection layer in unmasked regions to form said first semiconductor mesa and said second semiconductor mesa above an etched region.

22. **(Original)** A method as recited in claim 20, wherein forming said ridge waveguide further comprises a step for etching said top clad layer between said first semiconductor mesa and said second semiconductor mesa.

23. **(Original)** A method as recited in claim 22, wherein said step for etching comprises a step for etching said top clad layer to within about 1 micron of said active layer.

24. **(Original)** A method as recited in claim 20, further comprising a step for applying a metal contact layer to at least a portion of said ridge waveguide.

25. **(New)** The device as recited in claim 1, further comprising an insulating layer extending over at least one of the mesas, and further extending over a portion of the ridge waveguide.

26. (New) The device of claim 1, further comprising a contact layer extending over at least a portion of said ridge waveguide and terminating short of at least one of the semiconductor mesas so that a boundary region is defined between a terminal portion of the contact layer and the at least one semiconductor mesa.